



Wednesday, June 29, 2022

Max Trehus  
Great Western Operating Company, LLC  
4093 Specialty Place, Unit B  
Longmont, CO 80504

Re: ALS Workorder: 2206323  
Project Name: Wilson IC 03-179HNX BH  
Project Number:

Dear Mr. Trehus:

Two water samples were received from Great Western Operating Company, LLC, on 6/14/2022. The samples were scheduled for the following analyses:

- Dissolved Gasses
- GC/MS Volatiles
- Inorganics
- Metals
- Total Extractable Petroleum Hydrocarbons (Diesel)
- Total Volatile Petroleum Hydrocarbons (Gasoline)


The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental  
Katie M. OBrien  
Project Manager

	<h1>Accreditations</h1>	Effective June 7, 2022
	ALS   Environmental – Fort Collins	

**Accreditations:** ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
Arizona	AZ0828
California (CA)	2926
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
Oklahoma	1301
Louisiana	197538
Maryland (MD)	285
PJLA (DoD ELAP/ISO 170250)	95377
PJLA (DOE-AP/ISO 17025)	95377
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO010992018-1
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	TN02976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280
Virginia	460305

**40 CFR Part 136:** All analyses for Clean Water Act samples are analyzed using the 40 CFR Part 136 specified method and include all the QC requirements.



## 2206323

### GC/MS Volatiles:

The sample was analyzed using GC/MS following the current revision of SOP 525 based on SW-846 Method 8260C.

The sample was analyzed outside the established hold time. See NCR #15456.

All remaining acceptance criteria were met.

### Dissolved Gasses:

The sample was prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.

All acceptance criteria were met.

### GRO:

The sample was analyzed following the current revision of SOP 425 generally based on SW-846 Methods 8000C and 8015D. TVPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C6 to C10.

All acceptance criteria were met.

### DRO:

The sample was analyzed following the current revision of SOP 406 generally based on SW-846 Methods 8000C and 8015D. TEPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C10 to C28.

All surrogate recoveries were within acceptance criteria with the following exception:

Surrogate	Sample	Direction
O-terphenyl	-1	Low

The low surrogate recovery is due to matrix interferences. No further action was taken.

All remaining acceptance criteria were met.



**Metals:**

The samples were analyzed following Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures. Analysis by Trace ICP followed method 200.7 and the current revision of SOP 834.

Sample 2206323-2 was to be analyzed for dissolved metals. The sample was filtered through a 0.45 micron filter and preserved with nitric acid to a pH less than two prior to analysis.

All acceptance criteria were met.

**Inorganics:**

The sample was analyzed following EMSL and Standard Method procedures for the current revisions of the following SOPs and methods:

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
Alkalinity	SM2320B	1106
Bicarbonate	SM2320B	1106
Carbonate	SM2320B	1106
TDS	SM2540C	1101
Chloride	300.0 Revision 2.1	1113
Sulfate	300.0 Revision 2.1	1113

All acceptance criteria were met.

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

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**OrderNum:** 2206323

**Client Name:** PDC Energy

**Client Project Name:** Wilson IC 03-179HNX BH

**Client Project Number:**

**Client PO Number:**

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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
03-179HNX A	2206323-1		WATER	13-Jun-22	9:00
03-179HNX B	2206323-2		WATER	13-Jun-22	9:00





**ALS Environmental - Fort Collins**  
**CONDITION OF SAMPLE UPON RECEIPT FORM**

Client: PDC ENERGY Workorder No: 2206323  
 Project Manager: KMO Initials: KC Date: 6/14/22

				N/A	YES	NO
1.	Are airbills / shipping documents present and/or removable?			X		
	Tracking number:					
2.	Are custody seals on shipping containers intact?			X		
3.	Are custody seals on sample containers intact?			X		
4.	Is there a COC (chain-of-custody) present?				X	
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)				X	
6.	Are short-hold samples present?					X
7.	Are all samples within holding times for the requested analyses?				X	
8.	Were all sample containers received intact? (not broken or leaking)				X	
9.	Is there sufficient sample for the requested analyses?				X	
10.	Are samples in proper containers for requested analyses? (form 250, <i>Sample Handling Guidelines</i> )				X	
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)				X	
12.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)				X	
13.	Were the samples shipped on ice?				X	
14.	Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*:	#6		RAD ONLY	X
Cooler #: <u>1</u> Temperature (°C): <u>0.3</u> # of custody seals on cooler: <u>0</u> External µR/hr reading: <u>NA</u> Background µR/hr reading: <u>10</u> Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES						

\* Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

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Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: KC

If applicable, was the client contacted? YES / NO / NA Contact: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Project Manager Signature / Date: Margaret G. O'Brien 6/15/22

Client: PDC Energy  
 Project: Wilson IC 03-179HNX BH  
 Sample ID: 03-179HNX A  
 Legal Location:  
 Collection Date: 6/13/2022 09:00

Date: 29-Jun-22  
 Work Order: 2206323  
 Lab ID: 2206323-1  
 Matrix: WATER  
 Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Alkalinity as Calcium Carbonate</b>			<b>SM2320B</b>			Prep Date: <b>6/27/2022</b> PrepBy: <b>AOW</b>
BICARBONATE AS CaCO3	560		20	MG/L	1	6/27/2022
CARBONATE AS CaCO3	190		20	MG/L	1	6/27/2022
TOTAL ALKALINITY AS CaCO3	750		20	MG/L	1	6/27/2022
<b>Diesel Range Organics</b>			<b>SW8015M</b>			Prep Date: <b>6/21/2022</b> PrepBy: <b>JRS</b>
Diesel Range Organics	35		1	MG/L	1	6/24/2022 23:53
Surr: O-TERPHENYL	65	*	69-120	%REC	1	6/24/2022 23:53
<b>Dissolved Gasses</b>			<b>RSK175</b>			Prep Date: <b>6/21/2022</b> PrepBy: <b>JRS</b>
METHANE	880		2	UG/L	1	6/24/2022 16:40
ETHANE	240		4	UG/L	1	6/24/2022 16:40
PROPANE	140		6	UG/L	1	6/24/2022 16:40
<b>Gasoline Range Organics</b>			<b>SW8015</b>			Prep Date: <b>6/21/2022</b> PrepBy: <b>JRS</b>
GASOLINE RANGE ORGANICS	11		1	MG/L	10	6/22/2022 12:29
Surr: 2,3,4-TRIFLUOROTOLUENE	117		80-120	%REC	10	6/22/2022 12:29
<b>GC/MS Volatiles</b>			<b>SW8260_25</b>			Prep Date: <b>6/28/2022</b> PrepBy: <b>TWK</b>
BENZENE	95		10	UG/L	10	6/28/2022 22:53
TOLUENE	220		10	UG/L	10	6/28/2022 22:53
ETHYLBENZENE	67		10	UG/L	10	6/28/2022 22:53
M+P-XYLENE	210		10	UG/L	10	6/28/2022 22:53
O-XYLENE	130		10	UG/L	10	6/28/2022 22:53
TOTAL XYLENES	340		1	UG/L	1	6/28/2022 22:53
Surr: 4-BROMOFLUOROBENZENE	100		80-120	%REC	10	6/28/2022 22:53
Surr: DIBROMOFLUOROMETHANE	85		80-120	%REC	10	6/28/2022 22:53
Surr: TOLUENE-D8	104		80-120	%REC	10	6/28/2022 22:53
<b>Ion Chromatography</b>			<b>EPA300.0</b>			Prep Date: <b>6/17/2022</b> PrepBy: <b>AOW</b>
CHLORIDE	3400		50	MG/L	250	6/17/2022 14:04
SULFATE	260		250	MG/L	250	6/17/2022 12:37
<b>Total Recoverable Metals by 200.7</b>			<b>EPA200.7</b>			Prep Date: <b>6/21/2022</b> PrepBy: <b>ETC</b>
CALCIUM	2700		100	MG/L	10	6/22/2022 13:41
POTASSIUM	760		100	MG/L	10	6/22/2022 13:41
MAGNESIUM	ND		100	MG/L	10	6/22/2022 13:41
SODIUM	1100		100	MG/L	10	6/22/2022 13:41
<b>Total Dissolved Solids</b>			<b>SM2540C</b>			Prep Date: <b>6/17/2022</b> PrepBy: <b>KRL</b>
TOTAL DISSOLVED SOLIDS	16000		400	MG/L	1	6/22/2022

**Client:** PDC Energy  
**Project:** Wilson IC 03-179HNX BH  
**Sample ID:** 03-179HNX B  
**Legal Location:**  
**Collection Date:** 6/13/2022 09:00

**Date:** 29-Jun-22  
**Work Order:** 2206323  
**Lab ID:** 2206323-2  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Dissolved Metals by 200.7</b>			<b>EPA200.7</b>		Prep Date: <b>6/21/2022</b>	PrepBy: <b>ETC</b>
<b>CALCIUM</b>	<b>3000</b>		<b>100</b>	<b>MG/L</b>	10	6/22/2022 13:42
<b>POTASSIUM</b>	<b>840</b>		<b>100</b>	<b>MG/L</b>	10	6/22/2022 13:42
<b>MAGNESIUM</b>	<b>ND</b>		<b>100</b>	<b>MG/L</b>	10	6/22/2022 13:42
<b>SODIUM</b>	<b>1200</b>		<b>100</b>	<b>MG/L</b>	10	6/22/2022 13:42

**Client:** PDC Energy  
**Project:** Wilson IC 03-179HNX BH  
**Sample ID:** 03-179HNX B  
**Legal Location:**  
**Collection Date:** 6/13/2022 09:00

**Date:** 29-Jun-22  
**Work Order:** 2206323  
**Lab ID:** 2206323-2  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
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**Explanation of Qualifiers**

**Radiochemistry:**

- "Report Limit" is the MDC
- U or ND - Result is less than the sample specific MDC.
- Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
- Y2 - Chemical Yield outside default limits.
- W - DER is greater than Warning Limit of 1.42
- \* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.
- # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.
- G - Sample density differs by more than 15% of LCS density.
- D - DER is greater than Control Limit
- M - Requested MDC not met.
- M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
- L - LCS Recovery below lower control limit.
- H - LCS Recovery above upper control limit.
- P - LCS, Matrix Spike Recovery within control limits.
- N - Matrix Spike Recovery outside control limits
- NC - Not Calculated for duplicate results less than 5 times MDC
- B - Analyte concentration greater than MDC.
- B3 - Analyte concentration greater than MDC but less than Requested MDC.

**Inorganics:**

- B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).
- U or ND - Indicates that the compound was analyzed for but not detected.
- E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.
- M - Duplicate injection precision was not met.
- N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.
- Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.
- \* - Duplicate analysis (relative percent difference) not within control limits.
- S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

**Organics:**

- U or ND - Indicates that the compound was analyzed for but not detected.
- B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.
- E - Analyte concentration exceeds the upper level of the calibration range.
- J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).
- A - A tentatively identified compound is a suspected aldol-condensation product.
- X - The analyte was diluted below an accurate quantitation level.
- \* - The spike recovery is equal to or outside the control criteria used.
- + - The relative percent difference (RPD) equals or exceeds the control criteria.
- G - A pattern resembling gasoline was detected in this sample.
- D - A pattern resembling diesel was detected in this sample.
- M - A pattern resembling motor oil was detected in this sample.
- C - A pattern resembling crude oil was detected in this sample.
- 4 - A pattern resembling JP-4 was detected in this sample.
- 5 - A pattern resembling JP-5 was detected in this sample.
- H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.
- L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.
- Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
  - gasoline
  - JP-8
  - diesel
  - mineral spirits
  - motor oil
  - Stoddard solvent
  - bunker C

ALS -- Fort Collins

Date: 6/29/2022 1:50:3

Client: PDC Energy

QC BATCH REPORT

Work Order: 2206323

Project: Wilson IC 03-179HNX BH

Batch ID: HC220621-61-1

Instrument ID: FUELS-1

Method: SW8015

LCS		Sample ID: HC220621-61			Units: MG/L		Analysis Date: 6/21/2022 18:18				
Client ID:		Run ID: HC220621-61A			Prep Date: 6/21/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	0.494	0.1	0.5		99	80-120				20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.104		0.1		104	80-120					

LCSD		Sample ID: HC220621-61			Units: MG/L		Analysis Date: 6/21/2022 18:34				
Client ID:		Run ID: HC220621-61A			Prep Date: 6/21/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	0.489	0.1	0.5		98	80-120		0.494	1	20	
Surr: 2,3,4-TRIFLUOROTOLUENE	0.104		0.1		104	80-120			0		

MB		Sample ID: HC220621-61			Units: MG/L		Analysis Date: 6/21/2022 18:49				
Client ID:		Run ID: HC220621-61A			Prep Date: 6/21/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
GASOLINE RANGE ORGANICS	ND	0.1									
Surr: 2,3,4-TRIFLUOROTOLUENE	0.103				103	80-120					

The following samples were analyzed in this batch:

Client: PDC Energy  
 Work Order: 2206323  
 Project: Wilson IC 03-179HXX BH

# QC BATCH REPORT

Batch ID: **HC220621-81-1** Instrument ID: **FUELS-1** Method: **SW8015M**

LCS		Sample ID: <b>HC220621-81</b>			Units: <b>MG/L</b>		Analysis Date: <b>6/27/2022 12:05</b>				
Client ID:		Run ID: <b>HC220628-81A</b>			Prep Date: <b>6/21/2022</b>		DF: <b>1</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
Diesel Range Organics	9.42	1.07	8.33		113	53-120				20	
Surr: O-TERPHENYL	1.76		1.67		106	69-120					

LCSD		Sample ID: <b>HC220621-81</b>			Units: <b>MG/L</b>		Analysis Date: <b>6/27/2022 12:48</b>				
Client ID:		Run ID: <b>HC220628-81A</b>			Prep Date: <b>6/21/2022</b>		DF: <b>1</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
Diesel Range Organics	9.44	1.07	8.33		113	53-120		9.42	0	20	
Surr: O-TERPHENYL	1.78		1.67		107	69-120			1		

MB		Sample ID: <b>HC220621-81</b>			Units: <b>MG/L</b>		Analysis Date: <b>6/24/2022 19:39</b>					
Client ID:		Run ID: <b>HC220628-81A</b>			Prep Date: <b>6/21/2022</b>		DF: <b>1</b>					
Analyte	Result	ReportLimit										Qual
Diesel Range Organics	ND	1.1										
Surr: O-TERPHENYL	1.64				98	69-120						

The following samples were analyzed in this batch:

Client: PDC Energy  
 Work Order: 2206323  
 Project: Wilson IC 03-179HXX BH

# QC BATCH REPORT

Batch ID: **HC220621-91-2** Instrument ID: **MEE-1** Method: **RSK175**

LCS		Sample ID: <b>HC220621-91</b>			Units: <b>UG/L</b>		Analysis Date: <b>6/24/2022 15:19</b>				
Client ID:		Run ID: <b>HC220627-91A</b>			Prep Date: <b>6/21/2022</b>		DF: <b>1</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
METHANE	137	2	142		96	76-125				25	
ETHANE	260	4	267		97	70-120				25	
PROPANE	380	6	391		97	72-120				25	

LCSD		Sample ID: <b>HC220621-91</b>			Units: <b>UG/L</b>		Analysis Date: <b>6/24/2022 16:13</b>				
Client ID:		Run ID: <b>HC220627-91A</b>			Prep Date: <b>6/21/2022</b>		DF: <b>1</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
METHANE	133	2	142		93	76-125		137	3	25	
ETHANE	251	4	267		94	70-120		260	3	25	
PROPANE	367	6	391		94	72-120		380	3	25	

MB		Sample ID: <b>HC220621-91</b>			Units: <b>UG/L</b>		Analysis Date: <b>6/24/2022 15:23</b>					
Client ID:		Run ID: <b>HC220627-91A</b>			Prep Date: <b>6/21/2022</b>		DF: <b>1</b>					
Analyte	Result	ReportLimit										Qual
METHANE	ND	2										
ETHANE	ND	4										
PROPANE	ND	6										

The following samples were analyzed in this batch:

Client: PDC Energy  
 Work Order: 2206323  
 Project: Wilson IC 03-179HNX BH

# QC BATCH REPORT

Batch ID: IP220621-6-2 Instrument ID: ICP5900 Method: EPA200.7

LCS		Sample ID: IP220621-6			Units: MG/L		Analysis Date: 6/22/2022 13:39				
Client ID:		Run ID: IT220622-1A2			Prep Date: 6/21/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CALCIUM	39.9	1	40		100	85-115				20	
MAGNESIUM	38.4	1	40		96	85-115				20	
POTASSIUM	40.4	1	40		101	85-115				20	
SODIUM	40.4	1	40		101	85-115				20	

LCSD		Sample ID: IP220621-6			Units: MG/L		Analysis Date: 6/22/2022 13:40				
Client ID:		Run ID: IT220622-1A2			Prep Date: 6/21/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CALCIUM	40	1	40		100	85-115		39.9	0	20	
MAGNESIUM	38.4	1	40		96	85-115		38.4	0	20	
POTASSIUM	40.5	1	40		101	85-115		40.4	0	20	
SODIUM	40.4	1	40		101	85-115		40.4	0	20	

MB		Sample ID: IP220621-6			Units: MG/L		Analysis Date: 6/22/2022 13:37					
Client ID:		Run ID: IT220622-1A2			Prep Date: 6/21/2022		DF: 1					
Analyte	Result	ReportLimit										Qual
CALCIUM	ND	1										
MAGNESIUM	ND	1										
POTASSIUM	ND	1										
SODIUM	ND	1										

The following samples were analyzed in this batch:

Client: PDC Energy  
 Work Order: 2206323  
 Project: Wilson IC 03-179HNX BH

# QC BATCH REPORT

Batch ID: IP220621-6-3 Instrument ID: ICP5900 Method: EPA200.7

LCS		Sample ID: IP220621-6			Units: MG/L		Analysis Date: 6/22/2022 13:39				
Client ID:		Run ID: IT220622-1A2			Prep Date: 6/21/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CALCIUM	39.9	1	40		100	85-115				20	
MAGNESIUM	38.4	1	40		96	85-115				20	
POTASSIUM	40.4	1	40		101	85-115				20	
SODIUM	40.4	1	40		101	85-115				20	

LCSD		Sample ID: IP220621-6			Units: MG/L		Analysis Date: 6/22/2022 13:40				
Client ID:		Run ID: IT220622-1A2			Prep Date: 6/21/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CALCIUM	40	1	40		100	85-115		39.9	0	20	
MAGNESIUM	38.4	1	40		96	85-115		38.4	0	20	
POTASSIUM	40.5	1	40		101	85-115		40.4	0	20	
SODIUM	40.4	1	40		101	85-115		40.4	0	20	

MB		Sample ID: FP220620-6			Units: MG/L		Analysis Date: 6/22/2022 13:38					
Client ID:		Run ID: IT220622-1A2			Prep Date: 6/21/2022		DF: 1					
Analyte	Result	ReportLimit										Qual
CALCIUM	ND	1										
MAGNESIUM	ND	1										
POTASSIUM	ND	1										
SODIUM	ND	1										

The following samples were analyzed in this batch:

Client: PDC Energy  
 Work Order: 2206323  
 Project: Wilson IC 03-179HXX BH

# QC BATCH REPORT

Batch ID: VL220628-44-3 Instrument ID: HPV4 Method: SW8260\_25

LCS		Sample ID: VL220628-4			Units: %REC		Analysis Date: 6/28/2022 20:29				
Client ID:		Run ID: VL220628-44A			Prep Date: 6/28/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	25.5		25		102	80-120					
Surr: DIBROMOFLUOROMETHANE	23		25		92	80-120					
Surr: TOLUENE-D8	26		25		104	80-120					
BENZENE	10	1	10		100	80-120				20	
TOLUENE	10.9	1	10		109	80-120				20	
ETHYLBENZENE	10.8	1	10		108	80-120				20	
M+P-XYLENE	21.6	1	20		108	80-120				20	
O-XYLENE	11.1	1	10		111	80-120				20	

LCSD		Sample ID: VL220628-4			Units: %REC		Analysis Date: 6/29/2022 02:59				
Client ID:		Run ID: VL220628-44A			Prep Date: 6/28/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	25.9		25		104	80-120			2		
Surr: DIBROMOFLUOROMETHANE	22.4		25		90	80-120			3		
Surr: TOLUENE-D8	26.3		25		105	80-120			1		
BENZENE	9.97	1	10		100	80-120		10	1	20	
TOLUENE	11	1	10		110	80-120		10.9	1	20	
ETHYLBENZENE	10.8	1	10		108	80-120		10.8	0	20	
M+P-XYLENE	21.9	1	20		109	80-120		21.6	1	20	
O-XYLENE	11	1	10		110	80-120		11.1	1	20	

MB		Sample ID: VL220628-4			Units: %REC		Analysis Date: 6/28/2022 21:08				
Client ID:		Run ID: VL220628-44A			Prep Date: 6/28/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	26.7				107	80-120					
Surr: DIBROMOFLUOROMETHANE	22.4				90	80-120					
Surr: TOLUENE-D8	26.9				107	80-120					
BENZENE	ND	1									
TOLUENE	ND	1									
ETHYLBENZENE	ND	1									
M+P-XYLENE	ND	1									
O-XYLENE	ND	1									
TOTAL XYLENES	ND	1									

The following samples were analyzed in this batch:

Client: PDC Energy  
 Work Order: 2206323  
 Project: Wilson IC 03-179HXX BH

# QC BATCH REPORT

Batch ID: **AK220627-1-1** Instrument ID: **NONE** Method: **SM2320B**

LCS		Sample ID: <b>AK220627-1</b>			Units: <b>MG/L</b>		Analysis Date: <b>6/27/2022</b>				
Client ID:		Run ID: <b>AK220627-1A1</b>			Prep Date: <b>6/27/2022</b>		DF: <b>1</b>				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL ALKALINITY AS CaCO3	102	5	100		102	85-115				15	

MB		Sample ID: <b>AK220627-1</b>			Units: <b>MG/L</b>		Analysis Date: <b>6/27/2022</b>				
Client ID:		Run ID: <b>AK220627-1A1</b>			Prep Date: <b>6/27/2022</b>		DF: <b>1</b>				
Analyte	Result	ReportLimit	Qual								
BICARBONATE AS CaCO3	ND	5									
CARBONATE AS CaCO3	ND	5									
TOTAL ALKALINITY AS CaCO3	ND	5									

The following samples were analyzed in this batch:

Client: PDC Energy  
 Work Order: 2206323  
 Project: Wilson IC 03-179HXX BH

# QC BATCH REPORT

Batch ID: IC220617-1-1 Instrument ID: IC3 Method: EPA300.0

LCS		Sample ID: IC220617-1			Units: MG/L		Analysis Date: 6/17/2022 12:06				
Client ID:		Run ID: IC220617-1A1			Prep Date: 6/17/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CHLORIDE	10.1	0.2	10		101	90-110				15	
SULFATE	50.4	1	50		101	90-110				15	

LCSD		Sample ID: IC220617-1			Units: MG/L		Analysis Date: 6/17/2022 13:25				
Client ID:		Run ID: IC220617-1A1			Prep Date: 6/17/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CHLORIDE	10.1	0.2	10		101	90-110		10.1	0	15	
SULFATE	50.4	1	50		101	90-110		50.4	0	15	

MB		Sample ID: IC220617-1			Units: MG/L		Analysis Date: 6/17/2022 12:12					
Client ID:		Run ID: IC220617-1A1			Prep Date: 6/17/2022		DF: 1					
Analyte	Result	ReportLimit										Qual
CHLORIDE	ND	0.2										
SULFATE	ND	1										

The following samples were analyzed in this batch:

Client: PDC Energy  
 Work Order: 2206323  
 Project: Wilson IC 03-179HXX BH

# QC BATCH REPORT

Batch ID: **TD220617-1-1** Instrument ID: **Balance** Method: **SM2540C**

LCS		Sample ID: TD220617-1			Units: MG/L		Analysis Date: 6/22/2022				
Client ID:		Run ID: TD220622-1A1			Prep Date: 6/17/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	406	20	400		101	85-115				14	

LCSD		Sample ID: TD220617-1			Units: MG/L		Analysis Date: 6/22/2022				
Client ID:		Run ID: TD220622-1A1			Prep Date: 6/17/2022		DF: 1				
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL DISSOLVED SOLIDS	420	20	400		105	85-115		406	3	14	

MB		Sample ID: TD220617-1			Units: MG/L		Analysis Date: 6/22/2022				
Client ID:		Run ID: TD220622-1A1			Prep Date: 6/17/2022		DF: 1				
Analyte	Result	ReportLimit	Qual								
TOTAL DISSOLVED SOLIDS	ND	20									

The following samples were analyzed in this batch:

# CONTROLLED NON-CONFORMANCE REPORT

## Non-Conformance

**Initiated By:** Tyler W. Knaebel on 6/29/2022

**Event Type:** Method Requirements Not Met -- Holding Time Exceeded

**Event Explanation:** Samples 2206323-1, 2206325-1, and 2206359-1 were analyzed 1 day outside of the established holding time criteria due to instrument malfunction. During the initial analysis of the samples a random increase in pressure for the internal standard valve rendered the data unusable. No further action could be taken.

**Action To**

**Prevent Recurrence:** Random instrument malfunction which will likely require new parts and maintenance

## Corrective Action

**Corrective Action:**

**Department Manager Approval:**

**Approval Date:**

**Corrective Action Comments:**

Workorders Affected
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Workorder -- Procedure	Approved By	Approval Date
2206359 -- SW8260_25	PENDING	

No client contact information.

## Associated Batches

The samples were originally associated with the following Batch(es):

All rework was completed in the following Batch(es):

VL220628-44A created on 6/28/2022
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Not Applicable

## NCR Approval

**Project Manager Approval:**

TJM on 6/29/2022

**Department Manager Approval:**

**QA Manager Approval:**